

TECHNICAL REVIEW DOCUMENT
for
RENEWAL of OPERATING PERMIT 96OPWE154

Public Service Company, Ft. Lupton Combustion Turbines
Weld County
Source ID 1230014

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December 2001

Revised January 28, February 25, and March 18 & 21, 2002

I. Purpose:

This document will establish the basis for decisions made regarding the applicable requirements, emission factors, monitoring plan and compliance status of emission units covered by the renewed operating permit proposed for this site. The original Operating Permit was issued May 20, 1997, and expires on May 20, 2002. This document is designed for reference during the review of the proposed permit by the EPA, the public, and other interested parties. The conclusions made in this report are based on information provided in the renewal application submitted May 4, 2001, previous inspection reports, comments on the draft permit received February 21, 2002 and various e-mail correspondence, as well as telephone conversations with the applicant. Please note that copies of the Technical Review Document for the original permit and any Technical Review Documents associated with subsequent modifications of the original Operating Permit may be found in the Division files as well as on the Division website at <http://www.cdphe.state.co.us/ap/Titlev.html>.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised construction permit.

The word "credible" as it is used in the term "credible evidence" shall be applied under the provisions of the permit as defined by Colorado and Federal Rules of Evidence.

II. Description of Source

This facility is classified as an electric services facility under the Standard Industrial Classification 4911. This facility is an unmanned electric power generating station that consists of 2 simple cycle combustion turbines that can generate up to 100 MW of power. Typically this facility is used to service peak electrical load demands. The turbines are capable of burning natural gas, Nos. 1 and/or 2 fuel oil or combination. Based on the information available to the Division and provided by the applicant, it appears that no modifications to these significant emission units has occurred since the original issuance of the operating permit.

Note that neither turbine is equipped with a control device and therefore the Compliance Assurance Monitoring (CAM) requirements do not apply to these units.

The facility is located approx. 2 miles east of Ft. Lupton in Weld County. This facility is located in an area that has been designated as attainment for all criteria pollutants. Rocky Mountain National Park, a federal class I designated area, is within 100 km of this facility.

The summary of emissions that was presented in the Technical Review Document (TRD) for the original permit issuance has been modified to update actual emissions and to more appropriately identify the potential to emit (PTE). The PTE in the original TRD was based on emission factors and 8,760 hours per year of operation at the maximum design rate and did not take into account any regulatory emission limits, such as the Reg 1 PM and SO₂ emission limitations. In addition, since there has been a change in emission factors, for those pollutants whose PTE is based on emission factors, the PTE has been adjusted to reflect the updated emission factors. Emissions (in tons per year) at the facility are as follows:

Pollutant	Potential to Emit – 100% Natural Gas	Potential to Emit – 100% Nos. 1 and/or 2 Fuel Oil	Actual Emissions – Combination ³
PM ¹	579	579	18.6
PM ₁₀	579	579	18.6
SO ₂ ²	4,639	4,639	4.2
NO _x	1,856	5,103	194.8
CO	476	19.1	48.6
VOC	12.2	2.4	10.6

¹ PTE, when burning any fuel, is based the PM limit (0.1 lbs/mmBtu) x design heat rate x 8760 hrs/yr.

² PTE, when burning Nos. 1 and/or 2 fuel oil, is based on 0.8 lbs/mmBtu x design heat rate x 8760 hrs/yr.

³Actual emissions identified in the table are based on natural gas consumption only, although the turbines may burn either natural gas, Nos. 1 and/or 6 fuel oil, or combination. In addition, note that actual emissions are based on the old AP-42 emission factor and so for VOC, actual emissions appear to be very close to PTE. The old AP-42 emission factor for VOC, when burning natural gas was more conservative than the current AP-42 emission factor.

Potential to emit for the turbines is based on the information identified in the table and the maximum hourly fuel consumption rate, AP-42 emission factors and 8760 hrs/yr of operation. Actual emissions are based on the Division's 2000 inventory.

III. Discussion of Modifications Made

Source Requested Modifications

The source's requested modifications identified in the renewal application were addressed as follows:

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The Responsible Official and Permit Contact were changed as requested.

Section I, Condition 2 Alternative Operating Scenario

The source originally requested that the Division maintain records for purposes of the alternative operating scenario be retained at Ft. St. Vrain Station rather than Valmont Station. The Division agreed to make this change. In their comments on the draft operating permit, received February 21, 2002, the source requested that the use of alternate fuels be removed as an alternative operating scenario, since these units can run either oil, natural gas or combination and is not prohibited by permit to do so. Since the Division has included conditions for each scenario (natural gas, fuel oil and combination), the Division agrees that the use of alternate fuels does not need to be considered an alternative operating scenario. So Condition 2 was changed to reflect that no alternative operating scenarios have been requested.

Section II, Conditions 1.1 and 2.1 – Emission Factors

The source requested that the revised AP-42 emission factors be included in the permit. The Division agrees that the revised AP-42 emission factors should be included in the permit and therefore the following emission factors will be included in the permit.

Emission factors are from AP-42, Section 3.1 (April 2000), Tables 3.1-1 (for uncontrolled turbines) and 3.1-2a. The following emission factors will be included in the permit:

Pollutant	Natural Gas – Emission Factor (lbs/mmBtu)	Distillate Oil - Emission Factor (lbs/mmBtu)
PM	1.9×10^{-3}	4.3×10^{-3}
PM ₁₀	1.9×10^{-3}	4.3×10^{-3}
SO ₂ ^{1, 2}	3.4×10^{-3}	1.01S ¹
NO _x	0.32	0.88
CO	0.082	3.3×10^{-3}
VOC	2.1×10^{-3}	4.1×10^{-4}

¹ The emission factor for natural gas in the table 3.1-2a is 0.94S, but footnote h indicates that if “S” is not available, for natural gas, then an emission factor of 3.4×10^{-3} may be used. The Division is including the lbs/mmBtu emission factor in the permit.

²S = weight percent sulfur in fuel

In their comments on the draft permit submitted February 21, 2002 the source indicated that they wanted to base emissions on the lower heating value of the fuel for natural gas. The Division will allow this, however, since the AP-42 emission factors are based on the higher heating value of the fuel the Division will adjust the AP-42 emission factors to base them on the lower heating value of the fuel. The emission factors were adjusted as follows:

$$\text{EF lbs/mmBtu - LHV} = \frac{\text{EF lbs/mmBtu - HHV} \times \text{Btu gas, HHV}}{\text{Btu gas, LHV}}$$

Note that a value of 1016.5 Btu/SCF was used for the higher heating value and 916.4 Btu/SCF for the lower heating value. These values were provided by Xcel in a request to modify the construction permit for Ft. St. Vrain turbine 4 submitted on January 23, 2002. Since the Ft. St. Vrain and Ft. Lupton facilities are in the same general area, the Division presumes that the gas used at Ft. Lupton and Ft. St. Vrain would have similar characteristics.

Section II, Condition 2.4 – Sulfur Dioxide Emission Limits

The current permit required PSCo to perform an annual emission calculation to demonstrate compliance with the SO₂ emission limitation. However, the Division has indicated in other operating permits that when using Nos. 1 and/or 2 fuel oil, that compliance with the SO₂ limitation (0.8 lbs/mmBtu) is presumed because using the AP-42 emission factor, compliance with the limitation is achieved provided the sulfur content of the fuel is less than 0.5 weight percent and the heat content is no less than 88,125 Btu/gal. Typically, off-road diesel fuel (No. 2 fuel oil) has a sulfur content no greater than 0.5 weight percent and generally, the heat content of No. 2 fuel oil is 140,000 Btu/gal. The source is requesting that the monitoring method in this condition be changed to indicate that compliance is presumed, in the absence of credible evidence to the contrary, whenever Nos. 1 and/or 2 fuel oil are used as fuel. The change will be made as requested.

In their comments on the draft permit received February 21, 2002, the source

requested that a statement be added specifying that if no fuel oil is delivered in a particular year, then no fuel sampling is required for that year. The Division agreed and has included such a statement in the permit.

Section II, Conditions 3.1 – 3.6 – Turbines Burning a Combination of Fuels

The source requested that for consistency, the conditions related to burning a combination of fuels be removed and replaced with one condition specifying that the most stringent requirements and periodic monitoring be followed when burning a combination of fuels. The change will be made as requested.

Appendix A – Insignificant Activities

In their comments on the draft permit received February 21, 2002, the source requested that the two condensate storage tanks be removed from the list of insignificant activities and that three (3) 1,000 gal spill containment underground tanks be added to the list. These changes will be made as requested.

Other Modifications

In addition to the modifications requested by the source, the Division has included changes to make the permit more consistent with recently issued permits, include comments made by EPA on other Operating Permits, as well as correct errors or omissions identified during inspections and/or discrepancies identified during review of this renewal.

The Division has made the following revisions, based on recent internal permit processing decisions and EPA comments, to the Ft. Lupton Combustion Turbines Operating Permit with the source's requested modifications. These changes are as follows:

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Clarified dates for monitoring and compliance periods, i.e. changed "June - November" to "June 1 - November 30".

Monitoring and compliance periods and report and certification due dates are shown as examples. The appropriate monitoring and compliance periods and report and certification due dates will be filled in after permit issuance and will be based on the permit issuance date. Note that the source may request to keep the same monitoring and compliance periods and report and certification due dates as were provided in the original permit. However, it should be noted that with this option, depending on the permit issuance date, the first monitoring period and compliance period may be short (i.e. less than 6 months and less than 1 year).

The citation (above “issued to” and “plant site location”) on the page following the cover page provides the incorrect title for the state act. The title will be changed from “Colorado Air Quality Control Act” to “Colorado Air Pollution Prevention and Control Act”. In addition, the dates were removed from the citation.

Section I - General Activities and Summary

Removed language in Condition 1.1 that indicated the relative population of Ft. Lupton. This information is subject to change and is not necessary.

The language in Condition 1.3 was changed based on comments made by EPA on other Operating Permits.

Condition 1.4 was split into two conditions, one addresses enforceability (Condition 1.4) and the other recordkeeping requirements (Condition 1.5). Added “as noted” after Condition 17 to reflect changes that were made to Colorado Regulation No. 15 (ozone depleting compounds). Conditions 13 and 17 were renumbered to 14 and 18 due to the addition of a new general condition. Language was added to Condition 1.5 specifying that records shall be kept at Public Service Company’s Ft. St. Vrain Station, since Ft. Lupton is an unmanned facility and that electronic records are acceptable. Note that this language was previously indicated in Section II, Conditions 1.1, 2.1 and 3.1 of the permit.

Minor language changes were made to Conditions 2.1. thru 2.1.3.

Revised the language in Condition 3.1 to more appropriately address the PSD status of the source. In addition, based on comments made by EPA on another permit the following sentence was removed “Modifications up to this point in time have not triggered significance levels which would bring about PSD review.”

Based on comments made by EPA on another operating permit, the phrase “Based on the information provided by the applicant” was added to the beginning of Condition 4.1.

Added a “new” Section 5 for compliance assurance monitoring (CAM), note that no emission units are subject to CAM.

Section II - Specific Permit Terms

Section II.1: Turbines Burning Natural Gas

- Changed the format of Condition 1.1, included an equation to calculate emissions (this was previously in Condition 1.2). Removed language from Condition 1.1 regarding recordkeeping and electronic records as this information is contained in Section I, Condition 1.5 of the permit. In addition, minor revisions were made to the language in Condition 1.1.
- Based on comments made by EPA on other operating permits, the monitoring language in Condition 1.3 was changed to “In the absence of credible evidence to the contrary, compliance with the particulate matter standards shall be presumed whenever natural gas is used as fuel in these turbines.”
- Based on comments made by EPA on other operating permits, the monitoring language in Condition 1.4 was changed to similar language as specified for the particulate matter limits.
- The language regarding the monitoring for the 20% opacity requirement (Condition 1.5) was changed to similar language as specified for the PM limitation. In addition, the opacity standard was rewritten to more closely resemble the language in Regulation No. 1.
- Under “monitoring interval” in Table for Conditions 1.3, 1.4 and 1.5, replaced “annually” with “whenever natural gas is used as fuel”.
- Added a condition (Condition 1.6) for determining the heat content of the gas. The emission calculations rely on the heat content of the gas but there is no requirement in the permit to determine the heat content. The source will be required to sample and analyze the natural gas for heat content, annually, using ASTM methods, or equivalent if approved by the Division in advance.

The permit does not currently contain the 30% opacity requirements in Reg 1 Section II.A.4, which is applicable during certain operating activities. The specific activities under which the 30% opacity standard applies are: building a new fire, cleaning of fire boxes, soot blowing, startup, any process modification, or adjustment or occasional cleaning of control equipment. Based on engineering judgement the Division considers that building a new fire, cleaning of fire boxes and soot-blowing does not apply to the operation of a simple cycle combustion turbine burning natural gas. In addition, these turbines do not have control devices, so adjustment or occasional cleaning of control devices do not apply to these units. Process modifications may apply to turbines, however, based on engineering judgement, the Division believes that such activities would

be unlikely to occur for longer than six minutes. Startup is an activity that applies to these turbines, however the source has indicated that startup for these turbines is quick and lasts less than twelve (12) minutes. Under the Reg 1 30% opacity standard, one 6 minute interval in each hour while one of the specific activities is occurring, is not subject to an opacity limitation. For the remainder of the hour, the opacity emissions are limited to 30%, however, the 30% opacity standard is based on a six minute average. Therefore, for an emission unit that takes less than twelve (12) minutes to start up, the 30% opacity standard is not applicable. Therefore, the 30% opacity requirement has not been included in the operating permit.

Section II.2: Turbines Burning Nos. 1 and/or 2 Fuel Oil

- Changed the format of Condition 2.1, included an equation to calculate emissions (this was previously in Condition 2.2). Removed language from Condition 2.1 regarding recordkeeping and electronic records, as this information is contained in Section I, Condition 1.5 of the permit. In addition, minor revisions were made to the language in Condition 2.1.
- Based on comments made by EPA on other operating permits, the monitoring language in Condition 2.3 was changed to “In the absence of credible evidence to the contrary, compliance with the particulate matter standards shall be presumed whenever Nos. 1 and/or 2 fuel oil is used as fuel in these turbines.”
- Under “monitoring interval” in Table for Condition 2.3 replaced “annually” with “whenever Nos 1 and/or 2 fuel oil is used as fuel”.
- The opacity standard (Condition 2.5) was rewritten to more closely resemble the language in Regulation No. 1. In addition, the frequency of conducting method 9 readings was changed to annual, since the language in the current permit was somewhat confusing.
- The permit contains the 30% opacity requirement in Reg 1, Section II.A.4. As discussed for the natural gas burning scenario, the 30% opacity requirement applies during certain operating activities. In addition, as discussed under the natural gas burning scenario, none of the specific activities would apply to these turbines burning Nos. 1 and/or 2 fuel oil except for process modifications and startup. In addition, as discussed under the natural gas burning scenario, although process modifications and startups are activities that could occur, it is expected that these activities would last less than six (6) or twelve (12) minutes and therefore, the 30% opacity standard would not be applicable. Therefore, this condition was removed from the permit.
- Added a separate condition (Condition 2.6) for determining the heat content of the fuel oil. The emission calculations rely on the heat content

of the fuel oil and the requirement was included in Condition 2.4 and therefore it was not so obvious that fuel sampling was required. The source will be required to sample and analyze the fuel oil for heat content, annually, using ASTM methods, or equivalent if approved by the Division in advance.

Section III – Permit Shield

- The title for Section 1 was changed from “Specific Conditions” to “Specific Non-Applicable Requirements” and a new section 3 was added for subsumed (streamlined) conditions. Note that there were no streamlined conditions.
- Based on comments made by EPA on another permit, the following statements were added after the introductory sentence in Section 1 “This shield does not protect the source from any violations that occurred prior to or at the time of permit issuance. In addition, this shield does not protect the source from any violations that occur as a result of any modification or reconstruction on which construction commenced prior to permit issuance”.
- Based on comments made by EPA on another permit, the following phrase was added to the beginning of the introductory sentence “Based upon the information available to the Division and supplied by the applicant”.
- Based on comments made by EPA on another permit, the language in the justification (Section 1 - table) regarding modifications for the PSD and NSPS GG shield were removed. The shield for the PSD and NSPS requirements as non-applicable is based on the construction date of the turbines.

Section IV - General Conditions

- Added an “and” between the Reg 3 and C.R.S. citations in General Condition 3 (compliance requirements).
- Added language from the Common Provisions (new condition 3). Note that we are aware that the language in the Common Provisions may change in the near future, however, we have included the language in the Common Provisions Regulation as it is currently written. In the event that the language in the Common Provisions is revised and in effect prior to issuance of this permit we will include the revised language in the issued permit.
- The citation in General Condition 7 (fees) was changed to cite the Colorado Revised Statue. In addition, any specific identification of a fee

(i.e. \$100 APEN fee) or citation of Reg 3 was removed and replaced with the language "...in accordance with the provisions of C.R.S. [appropriate citation]."

- The citation in General Condition 13 (odor) was corrected. In addition, the phrase "Part A" was added to the citation for Condition 13 (odor). Colorado Regulation No. 2 was revised and a Part B was added to address swine operations. Colorado Regulation No. 2, Part B should not be included as a general condition in the operating permit.
- Condition 17 (ozone depleting compounds) was revised to reflect updates made to Colorado Regulation No. 15.
- The reference in Condition 28 (volatile organic compounds) to Regulation No. 7, Section III.C.3 was corrected to Regulation No. 7, Section VIII.C.3.
- Added the requirements in Colorado Regulation No. 7, Section V.B (disposal of volatile organic compounds) to General Condition 28.

Appendices

- First Page of Appendices – The phrase "except as otherwise provided in the permit" was added after the word "enforceable" in the disclaimer at the request of EPA.
- Appendix B and C were replaced with revised Appendices.
- The EPA addresses in Appendix D were corrected.